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ABSTRACT

Participation of women and minorities in science and engineering (S&E) higher education continues to rise, yet this involvement is not yet equivalent to their representation in the U.S. population of 18-30-year-olds. This data brief gives statistical information on enrollment and degree attainment among women and minorities at the undergraduate and graduate levels in 1995 and also compares trends in the data from 1985-1995. The number of S&E bachelor's degrees earned by women and underrepresented minorities increased between the 1980s and mid-1990s. Although still underrepresented in S&E in 1995, the number of S&E bachelor's degrees received by women (175,931) was a 36-percent increase over the number earned a decade earlier (128,871). The number of underrepresented minorities earning S&E doctorates rose 68 percent from 711 in 1985 to 1,194 in 1995. (Author/WRM)

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Division of Science Resources Studies

DATA BRIEF

National Science Foundation

Directorate for Social, Behavioral, and Economic Sciences

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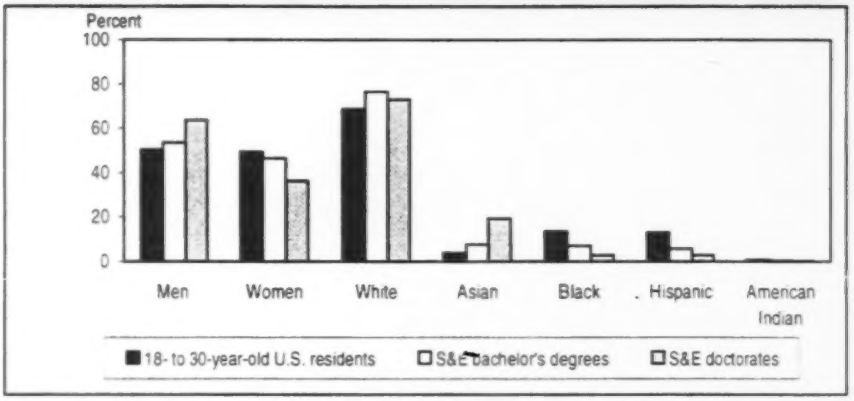
Despite Increases, Women and Minorities Still Underrepresented in Undergraduate and Graduate S&E Education

by Kristen Olson

The number of S&E bachelor's degrees awarded to women grew by 36 percent between 1985 and 1995.

Participation of women and minorities[1] in science and engineering (S&E) higher education continues to rise, but this involvement is not yet equivalent to their representation in the U.S. population of 18- to 30-year-olds. In 1995, women were 50 percent of U.S. residents between the ages of 18 and 30; blacks were 14 percent; Hispanics, 13 percent; and American Indians, 0.8 percent.[2] However, in the same year, 46 percent of S&E bachelor's degrees were earned by women, 7 percent by blacks, 6 percent by Hispanics, and 0.6 percent to American Indians. The proportions of S&E doctorates earned by these groups were even smaller: 36 percent earned by women, 3 percent by blacks, 3 percent by Hispanics, and 0.4 percent by American Indians. In contrast, Asians, who accounted for 4 percent of U.S. residents between 18 and 30 years old, earned 8 percent of the S&E bachelor's degrees and 19 percent of the S&E doctorates (figure 1).

Figure 1. Percent of U.S. residents between 18 and 30 years old, science and engineering bachelor's degrees and science and engineering doctorates, by gender and race/ethnicity of U.S. citizens and permanent residents: 1995



SOURCE: National Science Foundation, Division of Science Resources Studies, *Women, Minorities, and Persons with Disabilities in Science and Engineering: 1998*, forthcoming

[1]The term "minority" includes all groups other than white; "underrepresented minorities" comprises three groups whose representation in S&E is less than their representation in the general population: blacks, Hispanics, and American Indians.

[2]Source: U.S. Bureau of the Census, *Population Projections of the United States by Age, Sex, Race, and Hispanic Origin: 1995 to 2050*, P25-1130 (Washington, DC: Government Printing Office) Persons of Hispanic origin may be of any race. These data do not include the population of Puerto Rico.

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Undergraduate Education

In 1994, women made up 56 percent of total undergraduate enrollment at all institutions; blacks, 11 percent; Hispanics, 9 percent; and American Indians, 0.9 percent. Patterns of representation vary by type of institution. Each female racial/ethnic group was overrepresented or at parity compared to the 18- to 30-year-old population in two-year institutions in 1994, but black and Hispanic women were underrepresented at four-year colleges and universities. Asian men were overrepresented at both two-year and four-year institutions. Black and Hispanic men were underrepresented at both types of institutions.

Less than 5 percent of engineering doctorates and 7 percent of science doctorates in 1995 went to underrepresented minorities.

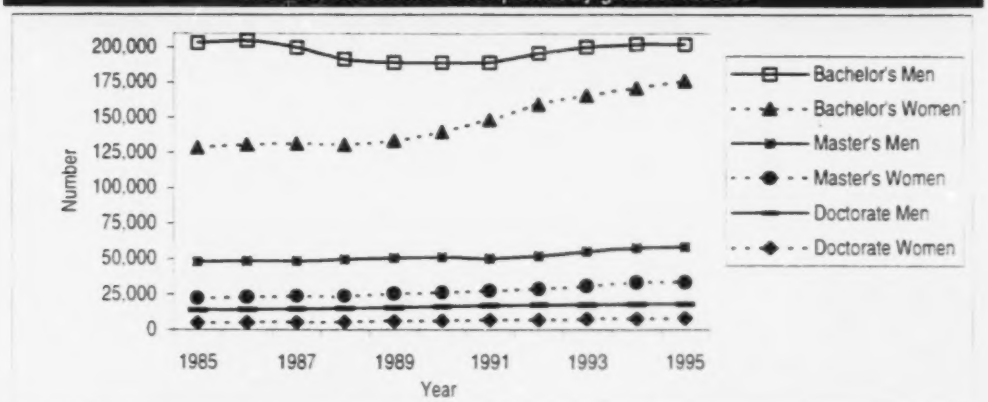
The number of S&E bachelor's degrees earned by women and underrepresented minorities increased between the 1980s and mid-1990s. Although still underrepresented in S&E in 1995, the number of S&E bachelor's degrees received by women (175,931) was a 36-percent increase over the number earned a decade earlier (128,871) (figure 2). Growth in representation was even more striking for racial/ethnic minorities. Overall, the number of S&E bachelor's degrees earned by underrepresented minorities increased by 62 percent from 31,950 in 1989 to 51,844 in 1995.

Representation also differs by field of undergraduate study within science and engineering. Compared to their representation among 18- to 30-year-olds in 1995 (which was between 6 and 7 percent), blacks and Hispanics of both sexes were underrepresented in all S&E fields. For example, black men earned 5 percent, and black women earned slightly less than 6 percent, of the computer science bachelor's degrees awarded in 1995. Hispanic men earned less than 5 percent, and Hispanic women only 1 percent, of the engineering bachelor's degrees.

Graduate Education

Like undergraduate enrollment, graduate student enrollment in science and engineering increased between 1985 and 1995, rising by 18 percent. This increase is largely due to a higher participation of women and minorities in S&E fields. The number of female S&E graduate students grew by 45 percent over the decade; the racial/ethnic minorities grew in number by at least 64 percent (Hispanics) and by as much as 100 percent (American Indians). These high rates of increase, however, reflect the low initial numbers of women and minorities in S&E fields. Despite these increases, women still only account for

Figure 2. Number of U.S. citizen and permanent resident science and engineering bachelor's, master's, and doctorate recipients, by gender: 1985-95



SOURCE: National Science Foundation, Division of Science Resources Studies, *Women, Minorities, and Persons with Disabilities in Science and Engineering:1998*, forthcoming.

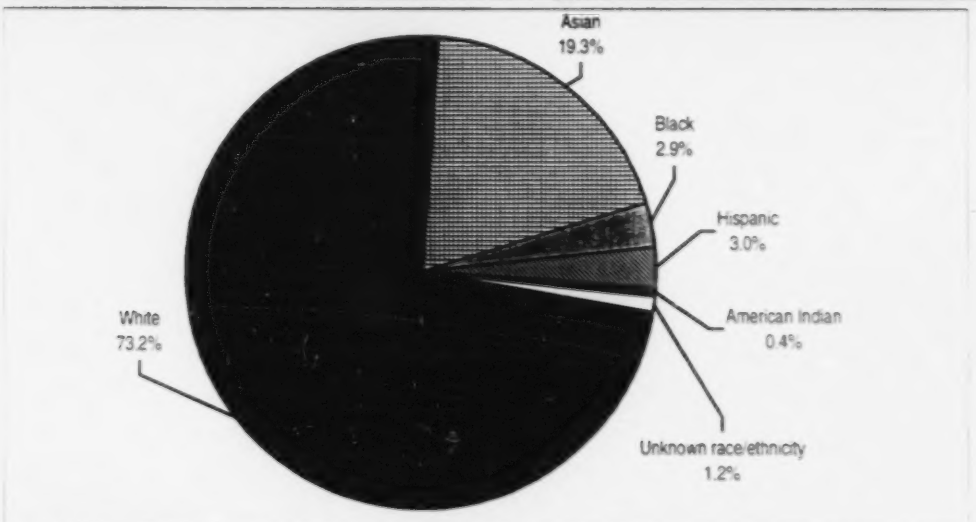
41 percent of S&E graduate school enrollment of U.S. citizens and permanent residents, blacks for less than 6 percent, Hispanics for slightly over 4 percent, and American Indians for 0.5 percent.

With the increase in graduate student enrollment came a corresponding increase in the number of S&E and nonS&E master's degrees awarded. The number of female S&E master's degree recipients rose from 22,331 in 1985 to 35,791 in 1995 (figure 2). In that latter year, women earned 55 percent of all master's degrees and 38 percent of all S&E master's degrees. The majority (84 percent) of women with master's degrees tend to earn them in non-S&E fields. Within S&E, however, they are overrepresented in psychology, earning 72 percent of the 1995 master's awards, and the biological sciences, earning 52 percent of master's degrees. As a broad field, engineering attracted the lowest proportion (17 percent) of women. Of the 38,401 master's degrees awarded to underrepresented minorities in 1995, 16 percent (6,223) were in S&E fields, 77 percent (4,804) of which were in the sciences. Over half of the S&E master's degrees earned by blacks in 1995 were in psychology or the social sciences. The largest proportion (28 percent) of S&E master's degrees earned by Hispanics was in engineering.

The number of S&E doctorates earned by all groups increased from 1985-95. Overall, more doctorates were awarded in S&E fields than in non-S&E fields in 1995: women earned more doctorates in non-S&E fields than in S&E. The number of women earning S&E doctorates increased steadily from 4,184 in 1985 to 6,892 in 1995—a 65-percent increase (figure 2). The number of underrepresented minorities earning S&E doctorates rose 68 percent from 711 in 1985 to 1,194 in 1995; much of this increase was due to a substantial rise in the enrollment of black women and Hispanic men in S&E doctorate education. This rise notwithstanding, blacks, Hispanics, and American Indians earned only a small proportion of the S&E Ph.D. degrees awarded in 1995 (figure 3).

Women and underrepresented minorities earn far larger shares of social science and psychol-

Figure 3. Percent of science and engineering doctorates, by race/ethnicity of U.S. citizens and permanent residents: 1995



SOURCE: National Science Foundation, Division of Science Resources Studies, *Women, Minorities, and Persons with Disabilities in Science and Engineering: 1998*, forthcoming

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ogy doctorates than of any other S&E field. They also tend to have higher representation in the natural sciences and very poor representation in engineering. The only S&E field in which women earned more doctorates than men in 1995 was psychology. Women attained over 40 percent of biological sciences doctorates, but only 10 percent of engineering doctorates in 1995. Of the 557 doctorates earned by blacks in 1995, over half were in the social sciences and psychology (27 percent in each field). Almost half (45 percent) of the S&E doctorates earned by Hispanics in 1995 were in the natural sciences. In 1995, underrepresented minority men earned about 4 percent, and underrepresented minority women earned less than 1 percent, of all engineering doctorates.

More detailed data on these topics are in the soon-to-be-released National Science Foundation, Division of Science Resources Studies report, *Women, Minorities, and Persons with Disabilities in Science and Engineering: 1998*, forthcoming (Arlington, VA, 1999).

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